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8.6 Preliminary design on diagnostic port plug for CFETR

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Currently Chinese Fusion Engineering Test Reactor (CFETR) has completed its physical design and started the phase of engineering design. To make transfer easier from Phase I to Phase II with the same machine, a larger size with $R = 6.6 \text{ m}$, $a = 1.8 \text{ m}$, $BT = 6-7 \text{ T}$ has been chosen. Diagnostic port plug, as one important part for reactor, will provide a common platform to support or contain variety diagnostic systems that require an external radial access to the plasma. Now we are considering two diagnostic port plug models, one is ITER-like case which is similar to the ITER diagnostic port plug structure, and another one is towards DEMO case, as a new way to DEMO. In this paper, we present a preliminary design and study for CFETR ITER-like case diagnostic port plug. Firstly, the design justification is given and equal diagnostic port plug model is designed; Then, EM loads and total displacements during a 32ms disruption of a 19.6 MA plasma current have been shown; at last, some important issues, including diagnostic port plug installation/removal and remote handling for maintains, have been discussed.

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